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CROP TALK

OMAFRA Field Crop Specialists — Your Crop Info Source

Table of Contents

1. No-Till Corn Planting Following Early Hay Harvests
2. Foliar Fungicides on Soybeans
3. Recording Pasture Events
4. Field Scouting Tips
5. Straw for Sale - What Is It Worth?
6. Along the Road to Organic
7. Pricing Standing Hay

Brought to You by the Following OMAFRA Crop Specialists

Mike Cowbrough Weed Management Program Lead
Hugh Martin, Organic Crop Production Program Lead
Horst Bohner, Soybean Specialist
Ian McDonald, Applied Research Co-ordinator
Albert Tenuta, Field Crop Pathologist
Keith Reid, Soil Fertility Specialist
Jack Kyle, Grazier Specialist
Brian Hall, Alternative Production Systems Specialist
Peter Johnson, Cereals Specialist
Scott Banks, Emerging Crops Specialist
Gilles Quesnel, Field Crops, IPM Program Lead
Christine Brown, Nutrient Management Program Lead
Adam Hayes, Soil Management Specialist - Field Crops
Greg Stewart, Corn Industry Program Lead
Tracey Baute, Entomology, Field Crops Program Lead

Editor: *Joel Bagg, Forage Specialist*

Compiled by: Marian Desjardine, OMAFRA, London

No-till Corn Planting Following Early Hay Harvests

by Greg Stewart, Corn Specialist, OMAFRA

Corn producers looking for an opportunity to replace a declining hay field may consider planting corn following a first-cut harvest of hay or haylage. This late-planted corn crop is traditionally aimed at silage production. This may allow for earlier planted corn, that had originally been intended for silage, to be shifted to grain corn production. In some areas of the province, with proper hybrid selection, the late-planted crop may be targeted for grain corn production.

With time and heat unit accumulation being the limiting factors, this corn crop needs to be planted as quickly as possible following hay harvest. This makes the option of no-tilling the corn crop into the hay stubble very attractive. Many of the soil structural and erosion control benefits fostered by the previous forage crop will be enhanced and/or prolonged by using a no-till system.

Research Indicates Soil Moisture Is Key

The University of Guelph examined corn silage yields from several different cropping systems in a study conducted near Woodstock in 1988 and 1989. A five-year-old sod (75% alfalfa) was converted to corn production using both conventional tillage and no-till systems following the removal of a haylage crop in early June.

Ontario Ministry of Agriculture, Food & Rural Affairs, Crop Technology Branch

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Conventional and no-till silage yields were equivalent in 1989 but no-till yielded dramatically less than conventional tillage in 1988. Rainfall was 7% of normal during June of 1988, which resulted in no-till planting conditions that caused low plant stands and poor early growth. Success of the no-till corn planting following hay harvest in 1989 was attributed to adequate soil moisture.

Similar studies were conducted by the University of Wisconsin (M. Smith, P. Carter and A. Imholte) during 1985 to 1987, with similar results. No-till corn grain yields following an early season hay harvest where comparable to yields obtained by plowing in only one out of the three years. The successful no-tilling occurred in the year that had June rainfall that was above average. In the other two years of the experiment, no-till corn yields averaged 46 bu/acre less than those obtained with conventional tillage.

Low June Rainfall

If you are determined to plant corn following a hay harvest in early June and rain has been limiting, the lower risk alternative is some tillage prior to planting. This tillage does nothing to conserve moisture or soil structure. However, in these relatively hard, dry soils, it may be essential for good seed-to-soil contact and early corn root exploration. This is a common phenomenon in Ontario. Higher soil moisture can be measured in no-till compared to plowed soils, but if dry weather comes early the corn plants cannot establish a root system that allows for exploration of the soil profile. In these cases, no-till performs poorer than plowed ground. Even though your no-till ground has conserved more moisture the roots cannot get at it.

Adequate Soil Moisture

In years were soil moisture is adequate, no-till corn can do well in these sod fields providing we can get it established and off to a good start. Some suggestions are:

- Above average planter unit down pressure and overall planter mass will be required. No "light-weights" recommended.
- Some tight sods, especially those with a lot of grass in them, cannot be suitably worked with a three-coulter system common to many no-till planters. The resulting strip is clumpy, air filled and not conducive to germination or early plant growth. Try a single coulter along with trash removing wheels for a firmer, cleaner seedbed.
- Chemical control of the sod and other weeds is critical. Apply a recommended pre-harvest treatment to the hay crop and/or herbicides during pre-emerge or post-emerge windows of the corn crop.
- Select a hybrid with a heat unit rating suitable for the delayed planting date and intended use (silage or grain). Late-planted corn may be at greater risk to corn borer damage, so a Bt hybrid is recommended.
- Use a seed applied insecticide to prevent in insect feeding.

Foliar Fungicides on Soybeans

by Horst Bohner, Soybean Specialist, OMAFRA, Stratford

Many North American soybean trials have shown a yield boost with the use of a foliar fungicide, even in the absence of significant foliar diseases. This yield boost may be a function of controlling bean diseases that have previously been ignored. Or it may result from "plant health" benefits from the application of the fungicide.

"Plant Health" Benefits

These "plant health" benefits are usually associated with the strobilurin fungicides (Headline and Quadris). Several effects have been observed, including a reduction in the amount of ethylene in plants late in the season, delaying plant senescence. Fungicides may also improve carbon assimilation, improving plant growth efficiency and increasing tolerance to stress during flowering and pod fill. Although, all the effects on the plant are not fully understood, it is clear that foliar fungicides impact the plant enough to affect yield.

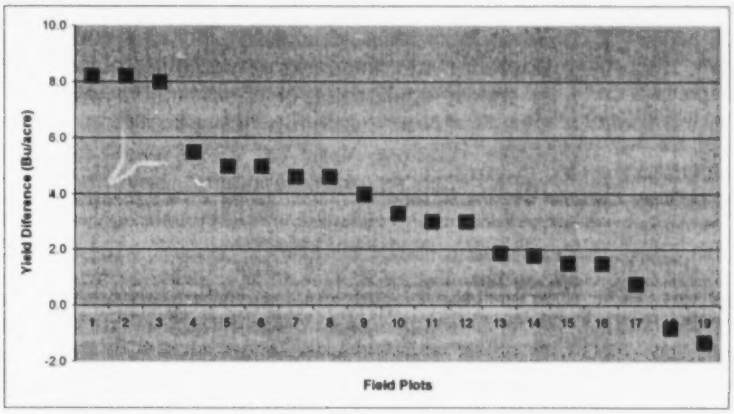
Ontario Strip Trials

Are these yield benefits large enough to warrant spraying in the absence of major disease outbreaks? In both 2005 and 2006, large scale replicated field trials were conducted to assess the possible yield benefits of strobilurins fungicides on soybeans. On-farm strip trials were set up by OMAFRA, local Soil and Crop Improvement Associations, Ontario Soybean Growers and various agri-businesses across a wide variety of soil types, environmental conditions and geographic locations. Data was collected from 19

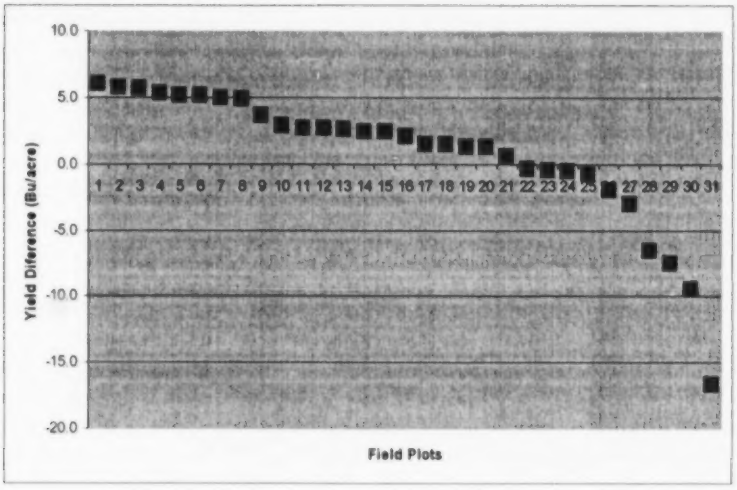
sites in 2005, and 31 sites in 2006. The majority of trials were sprayed with the fungicide at the R2 soybean plant growth stage (full bloom), as promoted in plant health literature.

Inconsistent Yield Gains

Graph #1: Soybean Yield Response to Foliar Fungicides in Ontario (2005)
Average Yield Gain of 3.6 bu/ac



Graph #2: Soybean Yield Response to Foliar Fungicides in Ontario (2006)
Average Yield Gain of 0.8 bu/ac



Economics

The results from these trials showed some yield benefit to soybeans when applying these products on a large percentage of the plots. In 2005, the average yield gain was 3.6 bu/ac, with 17 of the 19 trials (89%) showing some yield increase. In 2006, the average yield gain was only 0.8 bu/ac, with 21 of the 31 trials (68%) showing a yield gain.

The problem is that yield gains are both inconsistent and usually not high enough to be economical. The cost for strobilurins (Headline and Quadris) is approximately $16.00 per acre, excluding application costs. Assuming an application cost of $8.00 per acre, a tramping loss of 1.0 bu/ac and $7.00 soybeans, a 4.4 bu/ac yield increase would be required to break even. ($16.00 product + $8.00 application + $7.00 tramping loss).

In 2005, only 42% of the trials (8 of the 19) had a yield benefit of over 4.4 bu/ac. In 2006, only 38% of the trials (8 of the 21) had yield gains high enough for a positive economic return. In other words, 58% and 76% of the trials respectively had an economic loss.

The inconsistency of yield gain found in Ontario is similar to foliar fungicide trials conducted across many US States. Considerable research is now underway to understand when and where positive economic returns can be found with the use of foliar fungicides. Yield response may be associated with the amount of stress a plant is under, but even this theory has yet to be proven. Economic yield results have been too inconsistent when applying foliar fungicides to warrant their application in the absence of significant disease pressure.

Recording Pasture Events

by Jack Kyle, Provincial Grazier Specialist, OMAFRA

What pasture records are you keeping for the 2007 grazing season? Was your pasture more or less productive than last year? Do you have records to show the results of each of the past years performance for both the pasture and the livestock? These records will enable you to make comparisons that will provide valuable management information. Over time record keeping can give you an informative picture of your grazing management, and provide the tools to make more profitable grazing decisions.

A good set of pasture records provides details of what has happened and will allow for accurate comparison from one year to the next. A pocket notebook and three-ring binder can form the basis for a good system. It can be expanded to a complex computer spreadsheet if you are so inclined.

The records can be as simple or as complicated as you wish, but can include:

- weather data - rainfall amounts, frost dates, extreme summer temperatures
- forage or sward - pasture species mix, fertilizer application, forage growth at different times during the grazing season
- livestock - size, type and number of animals, frequency of moves to new paddocks, beginning and ending dates of grazing season, amount of residual forage, supplemental feed required.

Each year is different in the grazing business, but with records you will be able to analyze the differences. Did a lack of rain or too much rain affect production? One of the things that can happen is that lots of rain makes for green grass, yet cattle gains often are not as impressive as the grass growth. In a dry year, it often appears like the gains will be very low, and yet at weigh-off the gains can be better than might have been expected. Height and density are the two important components in sword evaluation. There are a number of tools to assist in measuring the amount of forage present, including a grazing stick or pasture plate.

With a good set of notes and records you will be able to manage your pasture for maximum returns.

Field Scouting Tips

by Gilles Quesnel, Field Crop Integrated Pest Management Specialist, OMAFRA, Kemptville

When it comes to assessing crop establishment, early plant development and pest management needs, a simple windshield observation or drive-by will not do. While field scouting has to be kept simple, each field needs to be walked individually.

Basic tools for field scouting includes a clipboard to record information, a pocketknife, plastic bags to collect specimens, a hand lens, a measuring tape, and a hula-hoop for population counts. When scouting, look for things that will affect yields, such as plant population, emergence, soil compaction, crusting, diseases, insects, weed escapes, herbicide injury etc.

Your field scouting pattern must be representative of the whole area. When scouting, take into account changes in variety/hybrid, soil type, past cropping history, fertilizer/manure application and any other factors that can affect plant growth.

To calculate plant population in row crops, count the number of plants in 1/1000 of an acre and then multiply the count by 1000 to obtain the number of plants per acre. Table 1 below lists the row length equal to 1/1000 of an acre at various row widths.

Table 1

What's 1/1000 of an acre	
Row Width In Centimetre (inches)	**Length of Row Equal to 1/1000 Acre**
33.0 cm (15")	10.62 m (34 ft., 10 in.)
50.8 cm (20")	7.97 m (26 ft., 2 in.)
76.2 cm (30")	**5.33 m (17 ft., 5 in.)**
81.3 cm (32")	4.98 m (16 ft., 3 in)
91.4 cm (36")	4.42 m (14 ft., 6 in.)

To determine plant population and pest infestation levels in narrow row crops, a sampling frame with a known area can be placed on the ground for the counts. This is done using a square frame (e.g. 50 cm x 50 cm equal 0.25 m^2) or a circular frame (e.g. a Hula-hoop). The Hula-hoop method is displayed in Table 2. Using the Hula-hoop, determine the number of plants per acre by counting the number of plants found inside the hoop and multiplying that number by the predetermined factor for the diameter of your hoop, which is listed in Table 2.

Table 2

Diameter of Hoop in Centimetres (inches)	Factor by Which to Multiply the Number of Plants Within the Hoop to Equal the Number of Plants per Acre
91 cm (36")	6,221
84 cm (33")	7,301
76 cm (30")	8,925
69 cm (27")	10,820
61 cm (24")	13,852

Regardless of the method used to determine plant population and pest infestation levels, at least 10 random counts should be taken in each field to determine an average.

The starting point for diagnosing problems is to look for patterns. Look for areas where the problem occurs and where it is absent.

- Crop problems that are consistent with the topography or the soil type of the field are more likely to be soil related than caused by pests or field operations.
- Problems which are worse on one side or edge of the field are likely to be related to spray drift or to the movement of insects into the field from one side.
- Problems, which occur on isolated plants throughout a field, may relate to diseases such as root rots.
- Problem areas within a field, which have sharply defined boundaries or appear in strips, are often related to field operations. Nematodes, however, are immobile enough that the edge of a nematode-infested spot may also be very distinct.
- Problems that are concentrated in one row but do not appear in an adjacent row are usually equipment or starter fertilizer related. The distance between affected rows will provide some insight into the width of the piece of equipment involved. At times, crop patterns may also relate to old field boundaries which could be up to ten years old or more.

Straw For Sale - What Is It Worth?

by Christine Brown, Nutrient Management Lead, Peter Johnson, Cereals Specialist, & Greg Stewart, Corn Lead, OMAFRA

Straw value is determined mostly by supply and demand. At what price is the straw better left in the field? Soil nutrient value of straw is at least 1.0 ¢/lb. This price should be at least 2.0 ¢/lb if nitrogen, organic matter and soil structure are a high priority for the field.

The sale of straw should at least recover the fertilizer replacement value. Fertilizer replacement value depends on the straw yield and cost of fertilizer, but there are also other factors to consider. Some of the reasons for removing straw may include:

- potential yield reductions caused from difficulties of no-till planting into straw residue,
- existing soil fertility levels are high and/or manure or red clover are returned to the field on a regular basis,
- additional trips or field operations are required to uniformly spread or incorporate straw and chaff, and
- low supply of straw resulting in higher demand and higher return.

Determining Wheat Straw Yield

With current wheat varieties there is a tremendous range of straw yield. The traditional rule of thumb was that one bushel of wheat grain produced one small square bale (35 lbs). That would translate into about 1.25 tonnes/ac straw for an 80 bushel crop. Realistic straw yields range between 1 to 1.75 tons/ac and are closely tied to wheat variety and grain yield. A straw yield of 2 tonnes/ac would be very optimistic, but not impossible. Table 1 shows the relationship between grain and straw yield based on variety.

Table 1: Impact of Wheat Variety Height on Straw Yield (2006 data)

Variety	Grain Yield	Straw yield	Straw yield
Emmit	100 bu/ac	3525 lbs	1.6 tonne/ac
25R47	100 bu/ac	2200 lbs	1.0 tonne/ac

Determining Straw Value

If selling the straw off the field is the best option, then as a minimum the price should reflect the fertilizer replacement value of the straw. The values of straw types estimated in Table 2 are based on average nutrient removal and average fertilizer prices. These values do not include organic matter value or micro nutrients. Many growers feel that the organic matter value far

Table 2: Estimated Nutrient Value of Various Straw Types

Straw Type	Grain Yield	Straw N-P-K Removal (lbs/ac)	Straw Value/ac P & K only [1]	Straw Value P & K only [2]	Straw Value/ac N, P & K [1]	Straw Value N, P & K [2]
Wheat	75 bu/ac	60-10-95	$32.5	1.1 ¢/lb	$62.5	2.1 ¢/lb
Barley	75 bu/ac	30-10-70	$ 25	0.8 ¢/lb	$ 40	1.3 ¢/lb
Oats	75 bu/ac	25-10-85	$29.5	1.0 ¢/lb	$ 42	1.4 ¢/lb
Rye	50 bu/ac	25-15-70	$ 27	0.9 ¢/lb	$39.5	1.3 ¢/lb
Corn stover	150 bu/ac	80-33-143	$56	1.4 ¢/lb	$96	2.4¢/lb

Source: Potash and Phosphorus Institute – 1998
[1] Commercial Fertilizer Value: N= $0.50 P_2O_5= $0.40 K_2O= $0.30
[2] Value based on 3000 lbs/ac straw yield; 4000 lbs corn stover yield

exceeds the nutrient replacement value. Organic matter value is significant, but will depend on many factors differing for each field and is definitely an individual decision.

Should Nitrogen Value be Considered in Straw Value?

The nitrogen contained in straw is not returned to the soil in the year following the wheat crop. For this reason some people only consider the phosphorus and potash value. Straw has a high carbon to nitrogen ratio, which means that soil nitrogen may actually decrease while the straw is broken down. The nitrogen in the straw is utilized by the microbial populations in the soil and becomes an important part of the soil organic matter. However, this process occurs over the longer term. This means that the nitrogen in straw will be more valuable from a soil quality perspective in a field that does not receive regular manure applications or does not have forages or red clover in the rotation.

Along the Road to Organic

by Hugh Martin, Organic Crops Lead, OMAFRA

Growers have heard about organic production and the potential for good financial returns. You also have probably heard of some horror stories. Every grower owes it to themselves to do some investigating to determine if there are opportunities for organic in their operation. Do some research. How do you grow it? Where do you sell it? There may be some ideas that you would want to adopt. Don't be afraid to change.

Organic Farm Tours

There are often summer tours of organic farms where you can see what is being done. Some of these tours will be listed at www.efao.ca. You could also visit some organic farms on your own. Some farms may have weeds or other issues, but make sure you see the whole picture. Looks can be deceiving! I remember 20 years ago when no-till was becoming more popular. No-till did not look very good to most of the experienced farmers, just because it was different!

Organic Neighbours

If you have an organic farmer in your neighbourhood get to know them and their practices. Work with your organic neighbours on cropping practices. Don't allow pesticide spray to drift onto your neighbours. They will likely be "certified organic", which means that they applied for certification last spring. This included a very detailed application form on their production practices, and they will be inspected this summer.

The inspector will make sure that there is at least 8 metres of buffer zone between the organic crops and non-organic crops. There must be 18 metres between organic soybeans and Roundup Ready soybeans. The distance between GMO and organic corn is required to be 600 metres. The organic sector feels this dramatically larger buffer is necessary because of the large distance that corn pollen can potentially travel. This is similar for canola. The

organic manufacturing industry has very low tolerances for adventitious GMO content in organic products. GMO corn has a huge impact on the potential to grow organic corn.

Transition Crops
Most organic farms start with a good rotation. They need 36 months as a "transition period" before the harvest of the first organic crop. During that period, only permitted organic inputs can be used. A hay crop that has not had any pesticide or fertilizer can be a good transition crop. Winter wheat can be a good transition crop, but you may need nitrogen from a previous legume or from manure before planting. Spring cereals underseeded with red clover can also be good transition crops. The best crop rotation rules are:

- a crop should never be repeated, and
- keep the ground covered with cover crops as much as possible.

Manure Use
It is recommended manure be composted. Manure cannot be used within 120 days of harvest of a food crop, or 90 days if the edible plants parts do not touch the soil. Manure can be brought onto the farm from non-organic sources, with the approval of the certification body. Manure from caged layer operations or "landless" livestock operations are not allowed. Non-organic manure must be composted 6 months to reduce any residuals of non-organic feeds or other products in the manure.

Weeds, Insects & Disease
The issues and challenges of each crop are different. Weeds are a common problem, but good early management is key. Timely, shallow, mechanical weed control works in most crops. Early vigorous growth and healthy crops will help the crop to compete. Don't let the weeds get the upper hand.

Insects and diseases are not serious problems for most field crops. You cannot use treated seed or GMO traits, but good quality seed planted into warm soil conditions usually get the crop off to a good start. Good crop rotations break pest cycles that result from continuous crops. Crops yield more with crop rotation.

As you drive down the road and see an organic farm look at the opportunities and wonder "what if"!

Pricing Standing Hay

by Joel Bagg, Forage Specialist, OMAFRA, Lindsay

What is standing hay worth and what is a fair price? The price of standing hay is what the market determines it is, not necessarily what we think it should be. From the seller's point of view, the price should cover the cost of production and provide a profit. However, there are limits to what buyers can and will pay that are related to the price of livestock, as well as the availability and price of other forages.

There is a tremendous range in standing hay prices. In recent years, we have seen prices from zero to over 3¢/lb of dry hay produced. The cost of production for a hay crop is typically at least 2¢/lb. However, the market does not always recover this. Some years, standing hay might trade from 1.5 to 2¢/lb for first-cut. Hay prices are often extremely volatile until after 1st cut, when there is a better idea of what the hay supply will be for the year. Similar to 2006 when there was a good hay crop, supply can exceed demand, reducing the price paid for second- and third-cuts.

Supply & Demand!
When hay supplies are low during dry years or following winterkill, standing hay will be in demand and worth more. Poor pasture years, when hay is fed during the "summer slump", also results in greater demand. The amount of spring inventory "carryover" from one year to the next can have a big impact. Lots of hay has been advertised for sale. There appears to be the potential for adequate hay in most parts of the province.

Higher Corn & Soybean Prices?
During years of higher corn and soybean prices, land shifts from hay to grain production, especially from some of the older, low yielding hay fields. Typically, hay prices will then increase in the longer term. A decade ago when we had some higher corn and soybean prices, we also saw a much stronger market for standing hay. Hay supplies became tighter, and some standing hay prices jumped up to as high as 3 or even 4¢/lb.

Factors That Affect Price

- **Cutting Date & Percent Alfalfa** - The earlier the date of cutting and the better the quality, the more the standing hay will be worth. Hay cut later will be worth less per pound, but there will be more pounds. Hay stands that contain more alfalfa are usually worth more.

- **Yield, Weeds & Age of Stand -** Higher yielding fields will be worth more per pound because the fixed harvesting costs per acre are spread over more lbs. Generally, newer stands are worth more, while hay fields that have been seeded down for a number of years will be weedier, lower yield, and worth less.
- **Location -** The location of the field relative to the buyer is important. A livestock producer may be willing to pay more if he doesn't have to haul long distances. A seller needs more than one interested buyer in order to bargain a higher price.

Considerations For The Seller

Sellers should start by determining their own cost of production per pound of standing hay. In an example budget, assume a $40 per acre land rental value, a four year hay crop, using typical custom rates and input costs, and a 6,000 lb annual hay yield in a 2-cut system. The cost of production for the standing hay in this example works out to about 2 cents per pound of dry hay, or $120 per acre per year.

Don't Forget P & K Removal

Forage has high fertility requirements and these costs are increasing. With a mixed stand, the value of phosphorous and potassium removal is close to 1 cent/lb. As an example, assuming a mixed stand with a modest yield of 3 tons per year, hay will remove about 36 lbs of P_2O_5 and 138 lbs of K_2O, with a value of $56 (assuming P_2O_5 @ $0.40, K_2O @ $0.30). Without manure or commercial fertilizer, the soil test will drop quickly. Assuming that it takes about 35 lbs/ac of P_2O_5 and 20 lbs/ac of K_2O to move the soil tests by 1 ppm on some soils, after 5 years the P_2O_5 soil test could drop by 5 ppm and the K_2O by 35 ppm.

Occasionally, standing hay is given away to avoid the down-side of leaving it in the field. The fixed costs, such as establishment, have already been paid regardless of whether or not the crop is harvested. As a minimum, a producer may want to recover the variable costs, which include the nutrient removal.

Considerations For The Buyer

Buyers should consider what their costs will be after the hay is baled. In this same example budget, swathing and raking costs 0.7 cents/lb, while large round baling costs about 0.8 cents. This means that the standing hay costing 2 cents per pound would result in a total cost of 3.5 cents, or $28 per bale for an 800 pound bale in the field. This may or may not reflect the local market. Also consider that in a standing hay transaction, the buyer assumes the weather risk of that hay getting rained on.

To accurately determine the pounds of hay sold it is helpful to weigh some bales or wagon loads. Pounds of haylage can be converted to a dry hay equivalent by adjusting for percent moisture.

It is important that you make your own assumptions and calculate your own costs to determine what you feel is an acceptable price. Then negotiate the best you can. Crop budgets and custom rates are available on the Ontario Ministry of Agriculture, Food & Rural Affairs website at www.omafra.gov.on.ca/english/busdev/analysis.html.